CprE 4920 Status Report 5

04/04/2025 - 04/17/2025

Group number: 8

Project title: Race of Doom

Client &/Advisor: Dr Bigelow

Team Members/Role: Alex Crandall, Wesley Jansen, Elizabeth Schmitt, Ben Towle, Lalitha Vattyam

Weekly Summary

The past couple of weeks we have made leaps and bounds in our progress. We decided that the speed problem that has been holding us up needs to be worked around. We have spent a lot of time trying to get everything perfect, but we just need to accept something that is not perfect and get this thing moving. We have gotten a lot of the movement figured out and the car is able to detect objects and move around them, stay in the correct lane, stop, and make turns when needed. We have been working on the AI model so that the camera can detect each different sign that is needed. We received the hat for the top of the Pi and have assembled it onto the Pi with the pins. We have also edited the design document in detail and we have a great start for the final thing.

• Past Week Accomplishments

• Team Member 1: Alex Crandall: Worked with connecting the new hat for the pi along with finding a location for testing.

• Team Member 2: Wesley Jansen : RPLidar Sensor has been looked at a lot and we do not have enough power at the moment to make it work. A USB hub has been ordered to try and fix this issue. Also for camera I made a flask server so we can attach a computer to the car and get the camera to work and run without needing video processing on pi.

• Team Member 3: Elizabeth Schmitt : The past 2 weeks I have really focused on and dived into the documentation for this project. I edited the design document extensively and am getting all of the those things ready for our final presentation and turn in/

Team Member 4: Ben Towle: Introduced a state machine implementation for the raspberry pi program that runs the car. Allowing our project to have flexibility in case we need to add, remove, or modify specific actions for the car to do
Team Member 5: Lalith Vattyam: Worked with Ben to get the car movement

figured out with the current speed issue. Tested and debugged with ben for left and right turns along with straightaway movement. I am currently working on the RealSense camera and getting a trained model configured to detect objects.

Pending issues

We need to trouble shoot ways to connect and Camera and to get it enough power while it is on the vehicle. That will be our main goal this coming week.

• Individual contributions

NAME	Individual Contributions (Quick list of contributions. This should be	<u>Hours These</u> <u>weeks</u>	HOURS cumulative
	short.)		
Alex Crandall	Connected pi hat and looked for areas to test the Car.	12	127
Wesley Jansen	Lidar steps, usb hub, flask server for camera	14	127
Elizabeth Schmitt	Documentation	12	124
Ben Towle	Improved the frame-rate of the webcam, found solution to the ESC problem, explored solutions for slowing the car down	25	144
Lalitha Vattyam	Finished the trained model to detect stops signs and construction cones on the camera	17	132

*Starting cumulative hours count on weekly report #1

• Plans for the upcoming week

• Alex Crandall – Work with Lalith to create obstacles for testing, along with ordering anything else we may need.

Wesley – Find a way to attach a computer to the car so the camera can work properly and how to send data from camera to pi successfully.

• Elizabeth – Work on the poster for our project and get all the wording for the design document, especially focusing on the operation manual.

• Ben –Complete all functional requirements for the R.C car. Including actions for handling its observation of stop sign, construction cone, crosswalk, and regular objects. In addition, I

need to keep the code commented, organized, and readable to set up the future team for success.

• Lalith – Finish the trained model and have it return a string back to the raspberry pi using a server connection for the rc car to run a functional logic.

• Summary of weekly advisor meeting

Last week we had a meeting with Dr Bigelow where we discussed the track, Lidar sensor, and the camera. We discussed possible locations for the track around campus and different obstacles. We found that we will need a flat room and we will need to find/make signs that the car can follow. We talked to him about scrapping the Lidar sensor from our design since it requires a lot of power from the Pi and it does not have. He agreed with our idea to not worry about the Lidar. We also spoke about placement of the Camera on the car, we will be putting the camera in the front facing forward. We also tossed around some ideas on how to power this camera. We will likely have to have it connected to a computer. We are not sure if that will be through Bluetooth or a tether yet.